EMERGENCY ACTION PLAN

Federal Marine Terminal
Riverview, Michigan

I. SITE DESCRIPTION, HISTORY, AND GENERAL INFORMATION:

The Federal Marine Terminal (FMT) site is a thirty-two acre area in Riverview, Michigan, bounded by Jefferson Avenue on the west, Firestone Corporation on the north, the Riverview boat ramp on the south, and the Trenton Channel of the Detroit River on the east. The site currently is mostly flat land composed of various grades and types of fill material. Various bodies of water and piles of debris break the flat contour. Appendix 1 contains a site diagram. The surrounding area is used for industrial purposes, including Firestone Steel Product plant, two Pennwalt Chemical production plants, a coke pile storage area, a BASF Wyandotte plant, a chlorine compound production company, and a truck terminal.

Prior to 1951 the site was owned by Firestone, at which time it was sold to Wyandotte Chemical Company, or its predecessor Michigan Alkali Co., which was bought out by BASF in 1970. The site had been a swampy area near the mouth of Monguagon Creek, with a 60 foot thick clay layer over a fractured limestone bedrock. The plot has been filled with refuse, including Michigan Alkali containers, various waste chemicals, and some fill and construction debris from 1951 to 1979. The amount of fill varies from 5 to 15 feet in depth, with more material placed at the riverward side of the property. EPA Eastern District Office records show that in 1972, a mound of arsenic wastes twenty feet in height was deposited near the river on the site. There is currently evidence of used mercury cells, used in a chlorination process, being discarded on the site.

In October, 1979, Federal Marine Terminals, Inc. purchased the property from BASF Wyandotte to develop the site as a commercial shipping terminal. A fairly extensive storm drain system and two building foundations were constructed in the southern third of the site. During the construction activities Army Corps of Engineers permit inspectors noted evidence of chemical contamination in the form of buried drums and glass containers. After collecting and inspecting contaminated soils, Michgian DNR staff required FMT to cease its dewatering operations which discharged to the Detroit River. FMT agreed to excavate a dewatering trench in the north-east portion of the property to prevent contaminated waters from leaving the site. Heavy rains later that month overwhelmed the holding capacity of that trench and the one on the north property boundary. In December, 1979 the Michigan DNR required FMT to install a 2000 foot long slurry wall to prevent contaminated groundwater migration from reaching the river. FMT began the project, but suspended efforts when BASF Wyandotte failed to assume responsibility. On January 2, 1980 BASF sued the terminal owner for nonpayment of its property debt; on January 22, 1980 FMT filed a countersuit against BASF for $15 million. On September 30, 1981 the U.S. Environmental Protection Agency joined in the litigation by filing suit against both companies.

Due to the threat of contaminated runoff reaching the Detroit River, the U.S. Coast Guard declared the site a Section 311 emergency in January, 1980. The Coast Guard constructed a trench along the western border of the project area to contain groundwater migration from the west from passing through the site. Later, contaminated water is this trench required them to plug its discharge to the river. After surface water runoff threat to navigable waters came under control, the Coast Guard turned the project over to the EPA Superfund Section of Region V.

Numerous geological, hydrological, and chemical studies have been performed on the FMT site. A June, 1979 study for BASF Wyandotte performed by Dames and Moore, Inc. concluded that the site contributed minimally to any contamination of the Detroit River although the soil and water samples were considerably polluted by EPA standards for water supplies and for aquatic life. The study assumed that the fill on site was homogeneous and impermeable to groundwater flow, conditions demonstrated by other studies to be incorrect.

In December, 1979 Applied Environmental Research (AER) of Ann Arbor did further testing for the FMT management. Results of this study (Appendix 2) also show serious groundwater contamination problems. The report also stated that of the fill material examined there was more chemical/industrial material than clean fill.

Sampling was done in January, 1980 by the Technical Assistance Team (TAT). Results of this study showed significant mercury problems on the site which are seeping mercury into the Detroit River. The study localized the source to the FMT property (Appendix 3).

In January of 1981 the Field Investigation Team (FIT) performed a hydrogeologic survey of the property. This study revealed a horizontal flow rate of groundwater in the fill area of 0.1 gal/min toward the river. The author concluded that because of this rate there would be little possibility of detecting any contamination from the site in the river waters. Groundwater and soil were tested for priority pollutants; results are attached as Appendix 4. High concentrations of several contaminants were found, including mercury and several polynuclear aromatic hydrocarbons. These results agree well with earlier spot samples taken by the Michigan DNR and others.

A later chemical sampling study was performed by Eastern District Office staff, in September 1981. GCMS analysis showed several spots contained very high concentrations of ethylbenzene and toluene. The data have not yet been assimilated into a covering report.

In October, 1981 the TAT again surveyed the property, to discern the biological features of the site. Although the west boundary ditch contained a normal biological community, the overflowed north ditch, with highly colored brown water, appeared to contain species capable of very quick colonization, perhaps occurring after the diluting rains. The dewatering trench was devoid of life; its content was a brown, somewhat viscous aqueous liquid.

In December, 1981, TAT then conducted a sampling survey in which six water samples and ten sediment samples were taken. The analysis proved to be high in aluminum silicates, magnesium, sodium, calcium, and iron. This is partially due to the parent ground material but mainly due to the chemical/industrial material which has been dumped on the site. The analysis also showed a low concentration of Mercury in both the water and sediment samples, however, the heavy metal content is still above ambient standards.

Currently there are large pools of standing water in places on the site, especially in the north. Although the west drainage ditch has been plugged, water leaves the property from the north ditch through an old railroad bed conduit at the northwest corner. A large area on the east drains directly to the river through obvious runoff channels. The southern third of the site drains the property to the river through the storm drain system installed by FMT, Inc.

II. SITE STATUS:

a). Security Measures

-The property is fenced on the north, west, and south sides. The river on the east prevents any land entrance onto the site. Although it is possible for fishermen to get very close to the FMT property along the river bank. The entrance gate is locked and only a limited number of keys exists. Signs are needed to warn the public of the potential dangers. This includes a warning sign stating that the fish caught in the Trenton Channel might contain a dangerous level of chemicals and/or heavy metals.

b). On-Going Activities

-No filling or dewatering operations are occuring.

c). Current Information on Extent of Contamination-Air

-No information available.

Surface Water

-The land locked dewatering trench, in particular, contains chemical and industrial contaminants; the north pond also has contaminants. The overall heavy metal content is high, according to the results of the TAT December 1981 sampling survey of FMT. According to the Wayne County Wastewater discharge levels five metals were in concentrations beyond their discharge levels. The five metals are aluminum, mercury, cadmium, copper, and zinc. See appendix #5. In December 1979, an earlier sampling survey was conducted in which a number of priority pollutants were found to be in the water. See appendix #2, Tables #2 and 3.

Soil

-Considerable contamination is shown by studies referred to in the site history. Migration to the river is slow enough to be undetectable in the river.

d). Current Information on Health/Environmental Impact

Site Safety
-A plan has been developed by the TAT.

Health
-No documented health effects.

Environmental Impact

-A TAT vegetation survey showed a dominance by weedy, opportunistic species on the FMT property which is a characteristic of a potentially polluted area. The Trenton Channel seems to possess no significant influence of chemical contaminants. This could also be attributed to the scoured sand-gravel bottom and the fast-flowing water.

There are several locations on the FMT property in which standing water exists. Each of these locations possesses a different habitat of organisms and plant life. The trench in the spoil mound area displays no live organisms and no plant growth. The water appears to be coffee-colored and more viscous than natural water. The trench on the west side of the property commands a healthy-looking biota. The area is filled with giant reeds (Phragmites) and cattails (Typha). Pragmites is a very tolerate species toward pollution. Mayflies, beetles and mosquitoes top the insect population which are characteristic of low oxygen content. Also, as previously mentioned, the water contains a high level of heavy metals which exceeds the Drinking Water Standards, the Freshwater Aquatic Life Levels, and the Wayne County Wastewater Levels. See Appendix #5.

III. Recommended Actions

a). Security:

-Warnings signs need to be installed as previously mentioned.

b). Extent of Contamination Studies:

-Those already performed show the path of pollutants to the Great Lakes System which would effect commercial and sport fisheries concerns because of the heavy metal content. Soil and groundwater should be sampled in the northern part of the site and along the old path of Monguagon Creek to define any contaminant migration. There is also potential of overflow onto city streets on the west side of the site by the parking area. This is a major concern since it is a public street which is heavily traveled.

c). Health/Environmental Studies:

-None

d). Mitigative Techniques:

-Excavate a 500' x 1' x 10' deep trench in the northern, most contaminated part of the site in the fill area; install a 12 inch PVC slotted pipe with a 20 foot standpipe on one end for collection of contaminated groundwater; backfill with pea gravel; and cover with fill. See Map of Proposed EAP.

-Place a 10 foot slurry trench for containment around a recipient area for contaminated soils, 400 feet by 300 feet, with the 500 foot pipe diagonally under this stragetically placed area. See Map of Proposed EAP.

-Move all contaminated soil and materials from the east side of the property into the area bounded by the slurry wall containment. See Map of Proposed EAP.

-Pump contaminated water from the standpipe and truck off site for proper treatment.

-Cap the contaminated area with two feet of clay, six inches of black soil, and seed with rye grass. See Map of Proposed EAP.

-Excavate shallow swales on the west and south sides of the contaminated spoil mound and connect them into existing storm sewer system to prevent contact of rainwater with the entombed soils and debris.

APPENDIX #5

PRELIMINARY

FMT WATER CONSTITUENTS VS. THE WATER QUALITY STANDARDS
DECEMBER 1981 TAT SURVEY

CONSTITUENT	LEVEL FOUND AT FMT (mg/1)	DRINKING WATER STD's (mg/1.)	WAYNE COUNTY WASTEWATER LEVEL (mg/1.)	FRESHWATER AQUATIC LIFE (mg/1.)
ALUMINUM	2.6	1.0	1.0	
IRON	4.8	0.3	-	
CALCIUM	68	-	-	
MAGNESIUM	16	-	-	
SODIUM	510	-	-	
ARSENIC	≅ 0.02	0.05	0.05	0.10
MERCURY	0.02	0.002	0.002	0.00005
CADMIUM	5.0	0.01	2.0	0.01
ZINC	90	5.0	5.0	-
COPPER	70	1.0	2.0	0.05 - 0.10

		Per day	No. of days	
Drain Installation:	Backhoe	$256	10	$ 2,560
	550' PVC pipes	$5/ft		2,750
	Pea gravel	$8/ cu yd		1,000
	D-9 dozer	$432	3	1,296
	Heavy equip. operator	$200	10	2,000
	" " "	"	3	600
	Laborers (4)	$528	10	5,280
	Supervisor	$296	10	2,960
	Dust masks	$350		350
				$ 18,796
Slurry Trench Injection:			10	$ 40,000
Move Fill Material:	D-9 dozer (2)	$864	25	$ 21,600
	Self loading scraper	$668	25	16,700
	Heavy equip. operator (3)	$600	25	15,000
	Supervisor	$296	25	7,400
	Civil engineer	$258.75	5	2,070
	Tool trailer	$125	25	3,125
	Dust masks	$150	25	3,750
				$ 69,645
Water Treatment:	9000 gal. tank trucks (2)	$570	25	$ 14,250
	½" pump	$ 65	25	1,625
	Treatment process			80,000
				$ 95,875
Cap Fill Material:	1000 cu yds clay	$18/yd		$ 18,000
	Self loading scraper	$668	10	6,680
	Front end loader	$314	10	3,140
	250 cu yds black dirt	$10/yd		2,500
	Rye grass seed			50
	Heavy equip. operator (2)	$400	10	4,000
	Supervisor	$296	10	2,960
				$ 37,330
Excavate Swales:	Backhoe	$156	5	$ 780
	Heavy equip. operator	$200	5	1,000
				$ 1,780
Grand Total:				$ 263,426

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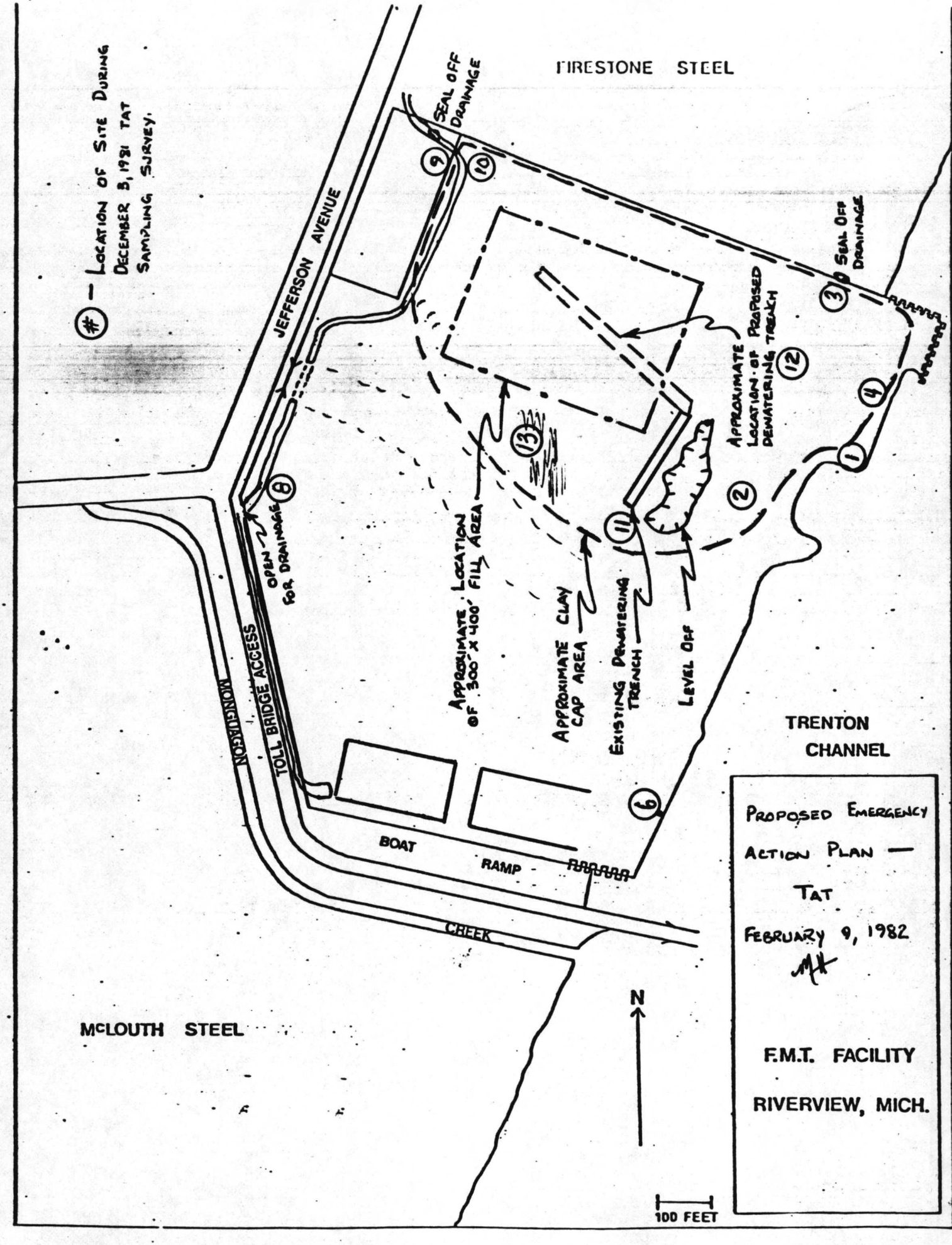
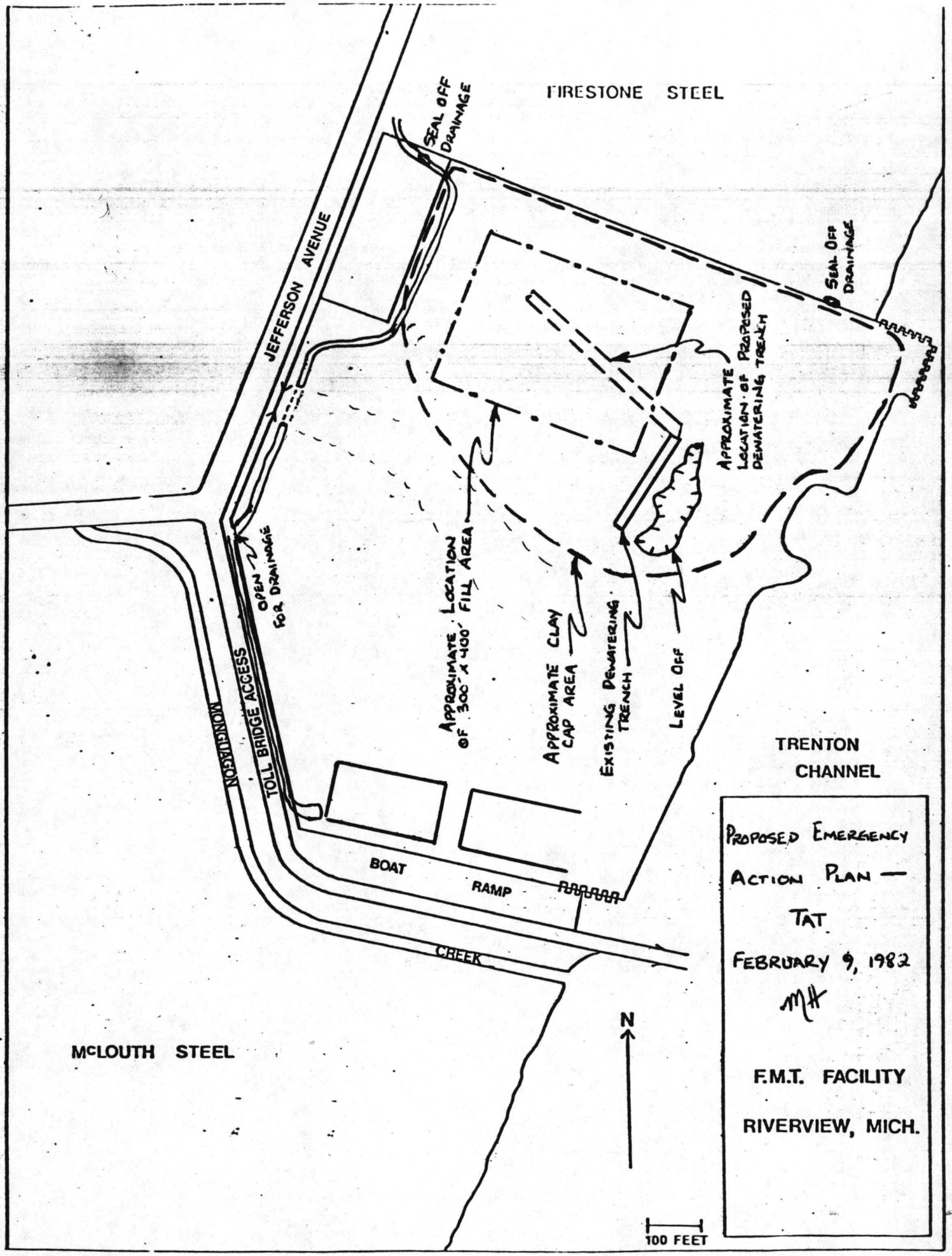
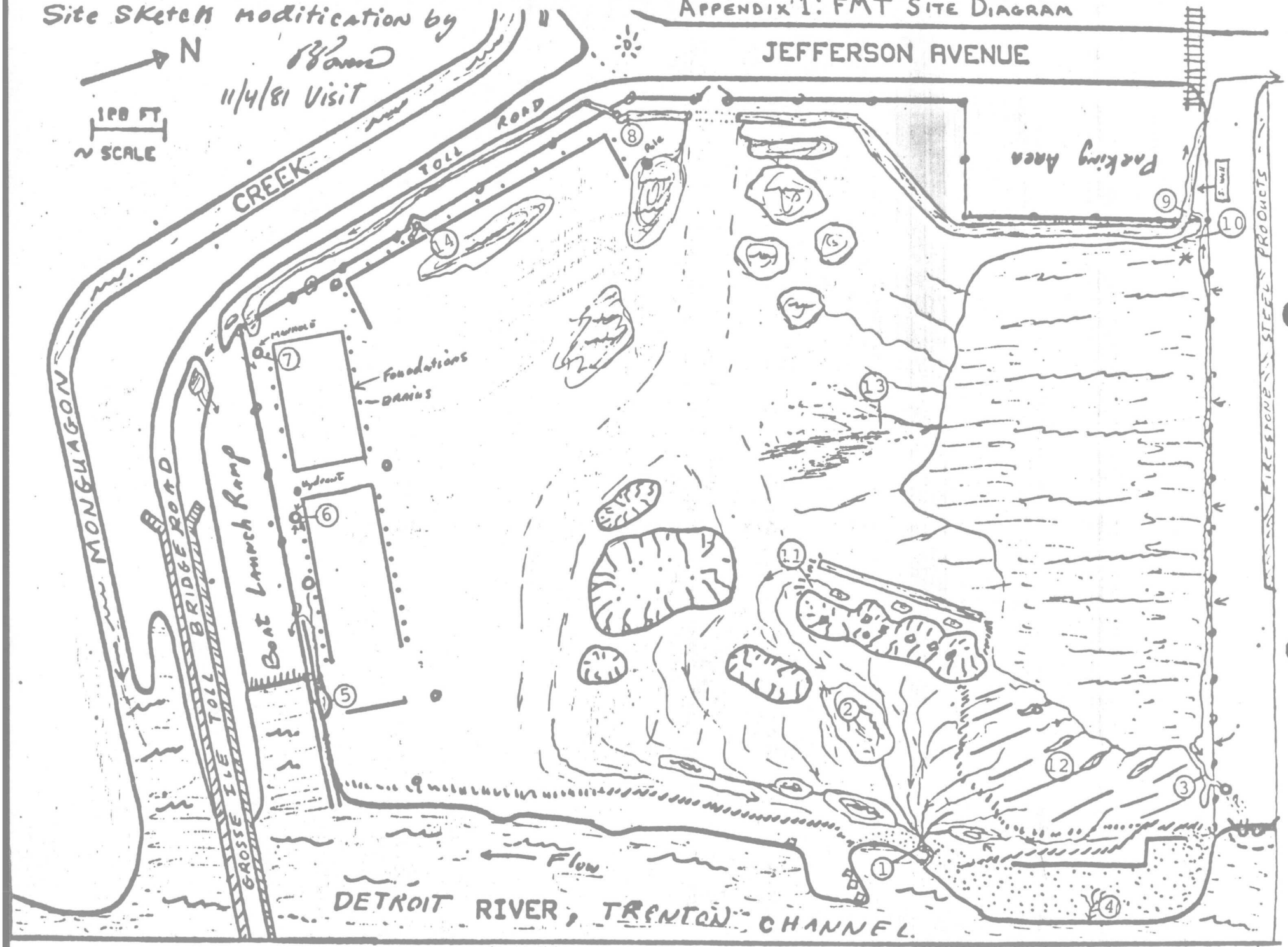
Riverview, Michigan

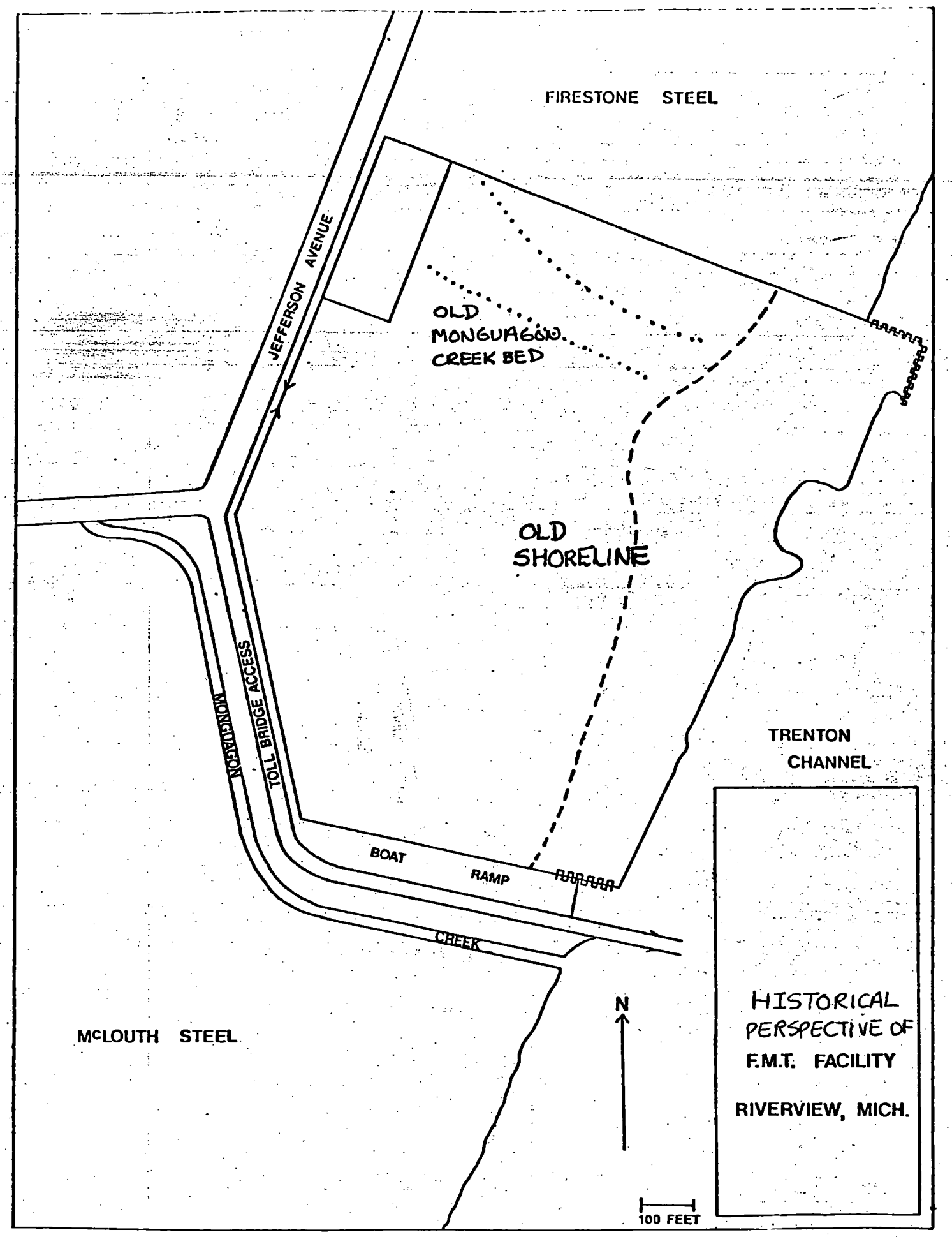
		Operational
Air Monitoring and Well Information		EPA/FIT
Drain Installation	$ 19,000	EPA/Contractor
Slurry Wall Installation	40,000	EPA/Contractor
Fill Material Relocation	70,000	EPA/Contractor
Water Treatment	96,000	EPA/Contractor
Fill Material Capping	37,000	EPA/Contractor
Swale Excavation	2,000	EPA/Contractor
Grand Total	$ 264,000	


(#) — Location of Site During December 8, 1981 TAT Sampling Survey.
FIRESTONE STEEL
SEAL OFF DRAINAGE
JEFFERSON AVENUE
SEAL OFF DRAINAGE
APPROXIMATE LOCATION OF PROPOSED DEWATERING TRENCH
APPROXIMATE LOCATION OF 300' X 400' FILL AREA
APPROXIMATE CLAY CAP AREA
EXISTING DEWATERING TRENCH
LEVEL OFF
OPEN FOR DRAINAGE
MONROE
TOLL BRIDGE ACCESS
BOAT RAMP
CREEK
McLOUTH STEEL
TRENTON CHANNEL
PROPOSED EMERGENCY ACTION PLAN — TAT
FEBRUARY 9, 1982
MH
F.M.T. FACILITY
RIVERVIEW, MICH.
N
100 FEET


FIRESTONE STEEL
SEAL OFF DRAINAGE
JEFFERSON AVENUE
SEAL OFF DRAINAGE
APPROXIMATE LOCATION OF PROPOSED DEWATERING TRENCH
APPROXIMATE LOCATION OF 300' X 400' FILL AREA
APPROXIMATE CLAY CAP AREA
EXISTING DEWATERING TRENCH
LEVEL OFF
OPEN FOR DRAINAGE
NORTHBOUND
TOLL BRIDGE ACCESS
BOAT RAMP
CREEK
TRENTON CHANNEL
McLOUTH STEEL
N
100 FEET
PROPOSED EMERGENCY ACTION PLAN — TAT
FEBRUARY 9, 1982
MH
F.M.T. FACILITY
RIVERVIEW, MICH.

Appendix 1: FMT Site Diagram




FIRESTONE STEEL
JEFFERSON AVENUE
OLD MONGUAGON CREEK BED
OLD SHORELINE
MONGUAGON
TOLL BRIDGE ACCESS
BOAT RAMP
CREEK
TRENTON CHANNEL
McLOUTH STEEL
N
100 FEET
HISTORICAL PERSPECTIVE OF F.M.T. FACILITY
RIVERVIEW, MICH.

Appendix 2: AER Study Results

Table 2. Summary of Subsurface Water Chemistry on December 12-13, 1979 at Federal Marine Terminals Site.

	Federal Marine Data Range (mg/l)	Federal Marine Data Mean	Wayne County Wastewater Limit (mg/l)	Drinking Water Standard (mg/l)	Freshwater Aquatic Life (mg/l)
HEAVY METALS					
Cadmium	<0.1-0.6	0.14	2.0	0.01	0.01
Total Chromium	<0.1-0.9	0.34	5.0	0.05	0.10
Chromium, hexavalent	<0.1-0.4	0.17	3.0		
Aluminum	0.4-76	16.0	1.0		
Antimony	<0.1-9.0	2.3	1.0		
Beryllium	<0.05	<0.05	0.01	NS	1.10
Cobalt	<0.01-2.4	0.73		NS	
Copper	<0.1-2.4	0.66	2.0	1.0	0.05-0.10
Lead	0.3-6.8	2.7	1.0	0.05	
Mercury	0.01-2.5	0.870	0.002	0.002	0.00005
Nickel	<0.01-5.3	1.8	3.0	NS	0.10
Selenium	0.06-0.55	0.27	1.0	0.010	0.025
Silver	<0.1-0.8	0.27	0.05	0.05	
Zinc	<0.1-2.9	0.94	5.0	5.0	

NS = No standard established as yet.

Table 2. Summary of Subsurface Water Chemistry on December 12-13, 1979 at Federal Marine Terminals Site.

	Federal Marine Data Range (mg/l)	Mean	Wayne County Wastewater Limit (mg/l)	Drinking Water Standard (mg/l)	Freshwater Aquatic Life (mg/l)
pH	7.4-12.4	10.8	6.5-8.0	5-9	6.5-9.0
COD	335-11800	3,990	600		
BOD	300-4900	3,030	300		
TOC	66-7000	2,100			
Grease and Oil	40-11,600	3,480	25	15	0.01
MBAS	1-4000	385			
Total Solids	4900-197,000	52,300	2000		
Suspended Solids	10-3810	1,340	350		
Volatile Solids	560-101,000	19,200			
Total Phosphorus (as P)	<0.03-84.8	18.8	13		
Total Kjeldahl N	4-300	82			
Ammonia	<0.1-97.2	24.2			0.02 (un-ionizec
Sulfate	240-4300	1600		250	
Sulfide	<1.0	<1.0	10		
Cyanide	<0.1-58.8	14.7	1.0	0.20	0.005
Arsenic	<0.05-0.30	0.10	0.1	0.05	0.10

NS = No standard established as yet.

Table 3

Summary of Organic Chemicals on the U.S. EPA Priority Pollutant List Detected in Subsurface Water Samples on December 12-13, 1979 at the Federal Marine Terminals Site

All Values in µg/l

Chemical	Number of Locations	Range	Mean	U.S. EPA Criteria* Freshwater Aquatic Life 24 hr. Avg.	Freshwater Aquatic Life Maximum Limit	Drinking Water
chloroform	7	5-44	16	500	1,200	2
1-2-dichloro-ethane	3	50-340	175	3,900	8,000	0.7-7.0
1,2-dichloro-propane	3	86-195	135	920	2,100	200
1,1,1-trichloro-ethane	6	9-104	30	5,300	12,000	15,700
tetrachloro-ethylene	5	11-62	25	NA	NA	NA
benzene	6	1-840	157	3,100	7,000	0.15-15
toluene	2	550-2480	1515	2,300	5,200	17,400
ethylbenzene	4	44-275	117	NA	NA	NA
chlorobenzene	2	13-1100	557	1,500	3,500	20
2-chlorophenol	4	8-615	168	60	180	0.3
2-nitrophenol	2	70-115	93	2,700	6,200	68.5
phenol	13	15-3000	534	600	3,400	3,400
2,4-dimethyl-phenol	8	5-465	109	38	84	NA
2,4-dichloro-phenol	2	10-660	335	0.4	110	0.5
trichlorophenol	4	5-1010	270	52	150	NA
p-chloro-m-cresol	4	15-145	75	NA	NA	NA

Table 3 (continued)

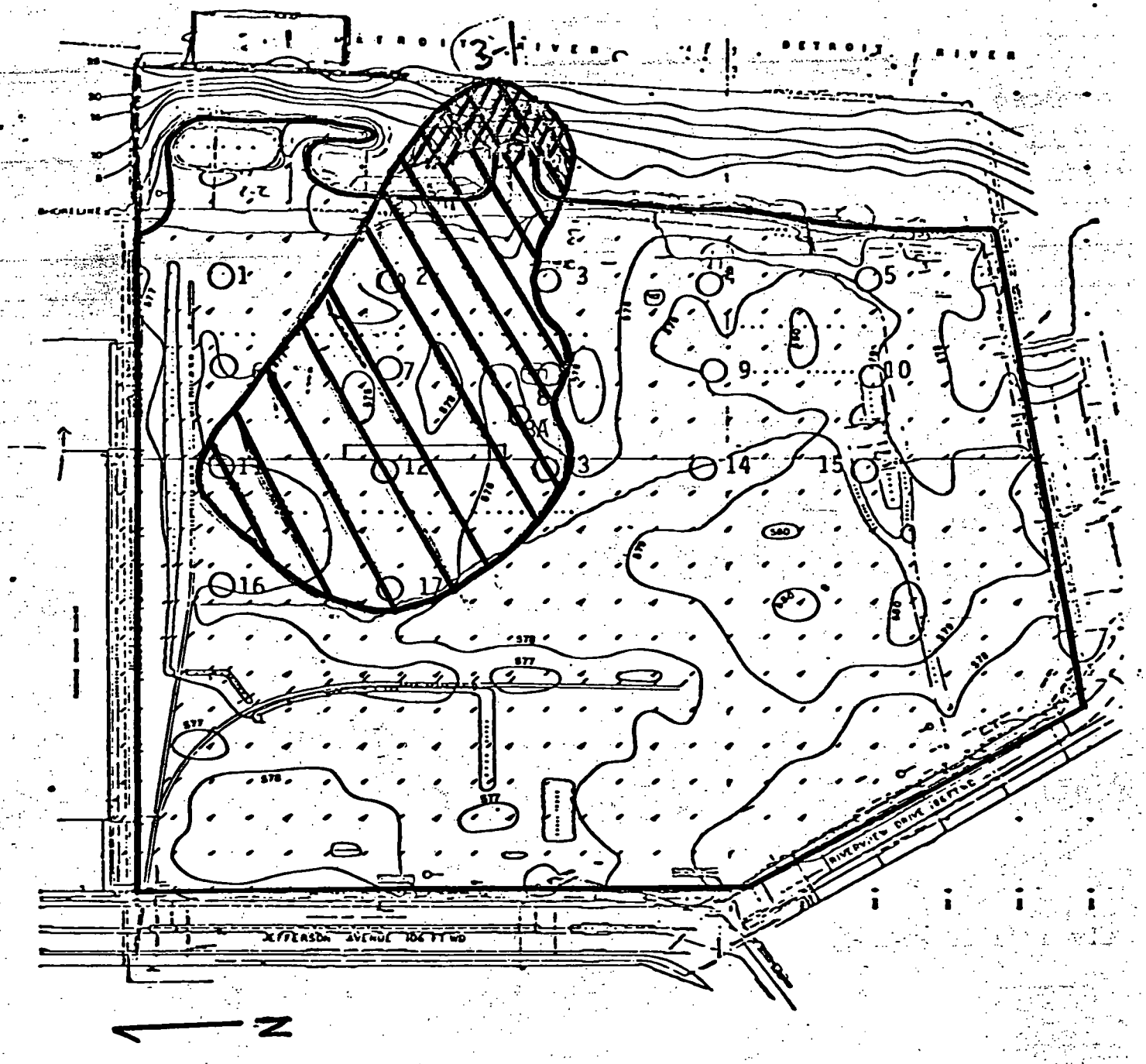
Summary of Organic Chemicals on the U.S. EPA
Priority Pollutant List Detected in Subsurface Water
Samples on December 12-13, 1979 at the Federal Marine Terminals Site

All Values in µg/l

Chemical	Number of Locations	Range	Mean	U.S. EPA Criteria* Freshwater Aquatic Life 24 hr. Avg.	Freshwater Aquatic Life Maximum Limit	Drinking Water
4-6-dinitro-o-cresol	1	-	35	NA	NA	12.8
pentachloro-phenol	9	80-1300	458	6.2	14	140
4-nitrophenol	5	25-145	70	NA	NA	NA
naptholene	12	40-27,000	3723	NA	NA	143
anthracene	10	90-13,300	2869	NA	NA	NA
ne	6	230-10,500	3942	NA	NA	NA
acenaphthylene	7	170-4200	1071	NA	NA	NA
fluorene	6	75-2550	758	NA	NA	NA
chrysene	1	-	150	NA	NA	NA
acerephthene	4	125-1450	579	110	240	20
fluoranthene	2	1115-2445	1780	250	560	200
dichlorobenzene	1	-	125	NA	NA	NA
di-n-octyl phthalate	2	100-300	200	NA	NA	10,000
dibutyl phthalate	1	-	160	NA	NA	5,000

*From U.S. EPA Water Quality Criteria. Federal Register, vol. 44, no. 52, p. 15926, March 15, 1979; Federal Register, vol. 44, no. 144, p. 43660, July 25, 1979; Federal Register vol. 44, no. 191, p.56228, October 1, 1979.

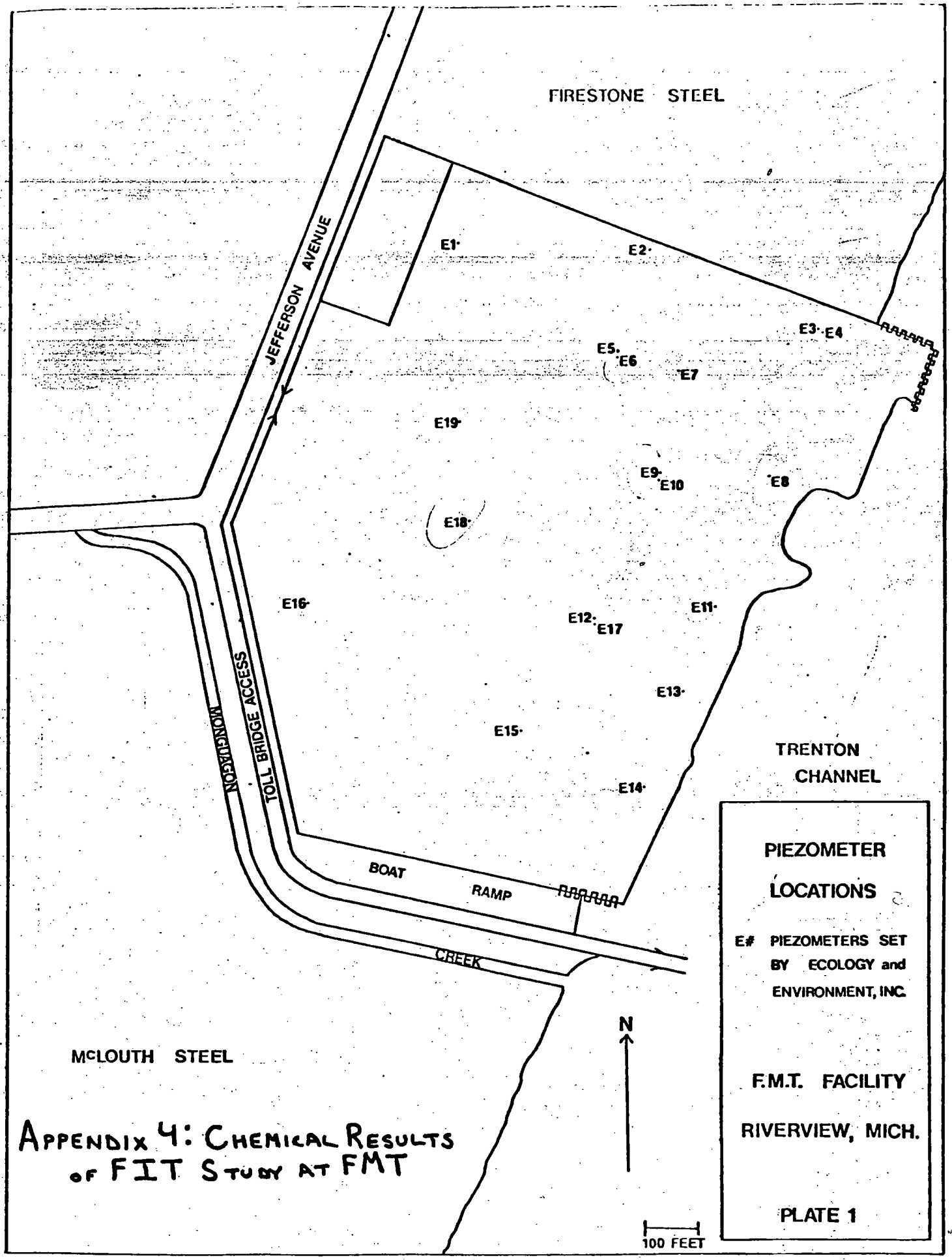
NA=No available information at this time.



CONC. OF Hg > 2 mg/l IN SOIL

CONC. OF Hg > 3.2 mg/kg IN SEDIMENT

APPENDIX 3: RESULTS OF TAT SAMPLING AT FMT



Appendix 4: Chemical Results of FIT Study at FMT